Available online at http://www.ijasrd.org/in

International Journal of Advanced Scientific Research & Development

Vol. 02, Iss. 04, Ver. II, Oct – Dec' 2015, pp. 140 – 143

e-ISSN: 2395-6089
p-ISSN: 2394-8906

AUTOMATIC LIBRARY SYSTEM USING ROBOTIC CONTROL SYSTEM IN EDUCATION

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ARTICLE INFO

Article History:

Received: 26 Dec 2015;
Received in revised form:
29 Dec 2015;
Accepted: 29 Dec 2015;
Published online: 30 Dec 2015.

Key words:

Robotic Arm,
Library Automation,
RFID Reader,
Conveyor,
Social Robot,
Human Robot Interaction,
Autonomy Design,
Stemming Algorithm,
WOZ

ABSTRACT

This paper will provide better service at input as well as output of library, in more elaborate form you have to just select the book at book issue counter book will come automatically to your end. Our librarian robot that is fixed in an experimental environment is able to say greeting properly based on estimation results of human behavior using a laser range finder and search books depending on a user's request When the robot explains where a requested book is in the library, it points out a target position using a laser spot while the body and head are also turned around to the direction of the target. However, the robot cannot always point out a target position directly using the laser pointer this would reduces the user efforts and save time.

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INTRODUCTION

A library is a collection of information resources; it provide invaluable service to its members, to a wider local community. Typically we need a librarian to pick the book and handover it to the person to whom the books are being issued. This might be an easy task in case the library floor area is small. Also, to search for the books by humans take a lot of time as many a times the books gets overlooked the human eye. To overcome this problem we introduce automation in library to fast diction of books and for picking we suggest a robot with an arm with some degrees of freedom which will be able to find out the book with the required tag and then pick it and place it on the table.

ROBOTIC ARM

In this paper, we are used Pick and place robotic arm to pick a book and place on coveyor and it forward towards counter. They are directed in both A and B directions to

How to cite this article: Palaniammal, T., & Palaniappan, M., (2015). "Automatic Library System Using Robotic Control System in Education". *International Journal of Advanced Scientific Research & Development (IJASRD), 02* (04/II), pp. 140 – 143.

place the book. There are many different types of pick and place systems. Examples include portable material handling systems, industrial manipulators. This pick and place robotic arm with wheels can be easily moved from one place to another. A pick and place robot manipulator can be used to pick an object and place them in an orderly manner to get a final destination A pick and place requires little operator and provides maximum output with efficiency. It is widely used in different industry to pick a different material and place in desire location.

Human–robot interaction is the study of interactions between humans and robots. It is often referred as HRI by researchers. Human–robot interaction is a multidisciplinary field with contributions from human–computer interaction, artificial intelligence, robotics, natural language understanding, design, and social sciences.

AUTONOMY DESIGN

The importance of autonomy can be summed up in the following slogan: No meaning without intention; no intention without function; no function without autonomy. This paper develops the role of autonomy to show how learning new tasks is facilitated by autonomy, and further by representational capacities that are functional for autonomy. Many past works focused on a robot that acts in everyday environment frequented by ordinary people. For instance, Burgardel at. Developed a tour guide with robust navigation skills that behaved as a museum tool. Siegwaert el at. developed a robot that guided people in large scale environments. Bauer el at. realized a robot navigating robot under an unknown urban environment using GPS data, cameras, laser range finders, and interaction with people. Some researchers develop robot to support people in daily environment such as shops. These cases indicate that autonomous robots are already feasible for delivering pre-defined messages associated with locations, particularly at many places with many people who have a special interest in robots, such as museums and world expos However the input for these robots are limited; although buttons and tactile sensors were robustly used, these robots did not exploit natural language, which largely limited their capabilities.

In many existing systems some mobile robots equipped with hands can handle books on a bookshelf. The autonomous mobile robot LUCAS has a graphical interface displaying a human-like animated character, and acts as a guide for a library user in a library. Some mobile robots with upper half of the body for guidance, is able to show a direction with their hand motions. However, it is not suitable for hands to point out a particular spot with accuracy.

PROPOSED SYSTEM

In this system we propose a new guidance method by that a library user can understand easily where a book of search results is in a library. A laser pointer is attached to the library robot's head with six degrees of freedom. When the robot explains where a requested book is in the library, it points out a target position using the laser spot while its body and head are also turned around to the direction of the target.

4.1 Disadvantages

- Complicated configuration

- No accuracy spot search
- Commanding is difficult

4.2 Advantage

- The robot has simpler configuration, and is rather close to the reception robot.
- The system will automatically fetch the exact location of the searched book and also it sends the commands to the robot.
- Although our robot cannot move, it is one of important tasks for it to guide a library user with clear explanations.
- A laser pointer is used effectively to point out a particular spot for guidance or explanation about a remote target or object.

4.3 Modification

We propose is, once the user provides the voice input, the system will verify all the available books, and finds out the best book by comparing Input term frequency with total number of keywords extracted using Stemming Algorithm. So that resultant book shelf is identified by the Robot.

MODULES DESCRIPTION

Robot with Laser Point: A laser pointer is attached to the library robot’s hand with six degrees of freedom. When the system commands the robot where a requested book is available in the library, it points out a target position using the laser spot. However, since the library is large and there are a lot of obstacles for guidance by the robot, such as book stacks and columns, the robot cannot always point out a target position directly using the laser pointer. So we design three types of guidance using the laser pointer depending on the library environment.

Admin: Admin module is the important module in this system. Since he only has the rights to design the commands and actions for the robot. Whenever the client gives his request that request is processed by the server system with the help of the admin guidelines. He has the responsibility to arrange the books in a specific order and also update the accurate information in the database based on dynamic process. Likewise if any new books are racks included in the system, he must update these details also in the database.

Client: The client system is the system which wants to get service or response from a server by forwarding request to the server. Clients can any person who needs the best book and the current location of that book among the several locations. He can directly send the request to the specified server or he can send the request to the main server.

Server: Whenever the client gives his input to the server to search the exact position of the best book in the library, the system receives the inputs and processes them. It will go through all books in the particular system based on request. Then it will find out the current location of the specified books from several racks and immediately forwards the location command to the robot via RF. This system also displays the user friendly messages to the client about the exact position of the book and the direction.

CONCLUSION

We proposed a new guidance method by that a library user can understand easily where a book of search results is in a library. Since the librarian robot points out a target or a direction to the target using the laser pointer attached to the robot's head, a library user is able to understand the guidance easily and intuitively. The validity and effectiveness of our proposed method were confirmed with the experimental results with two subjects. However, the number of the subjects is still few; we will have to perform further experiments to evaluate the validity and effectiveness of our proposed method with a quantitative. We are now planning to set up the librarian robot in one of the university libraries with library staffs. Since a library is usually a silent place, we are also concerned whether the guidance method with voice interaction is acceptable or not.

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